

REMARKS

I. Introduction

Claims 15 to 28 are currently pending in the present application. In view of the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration of the present application is respectfully requested.

Applicants thank the Examiner for considering the Information Disclosure Statement, PTO-1449 paper, and cited reference, filed September 19, 2006.

Applicants thank the Examiner for indicating that claims 22 to 26 include allowable subject matter.

II. Interview Summary

Applicants thank the Examiner for the courtesies extended during the telephone interview of January 11, 2007 with Applicants' representative, Aaron Grunberger (Reg. No. 59,210).

The following is a Statement of Substance of Interview of the telephone interview of January 11, 2007.

During the course of the telephone interview, no exhibit was shown and no demonstration was conducted.

During the course of the telephone interview, claims 15-21 and 26-28 and U.S. Patent No. 6,161,523 ("Unland et al.") were discussed.

During the course of the telephone interview, the Examiner agreed that claim 26 includes allowable subject matter, and that the indication in the Final Office Action of November 1, 2006 that claim 26 is rejected under 35 U.S.C. § 103(a) is a typographical error.

During the course of the telephone interview, the Examiner tentatively agreed that claims 27 and 28 should not have been rejected under 35 U.S.C. § 102(b) as anticipated by Unland et al. for the reasons more fully set forth below.

During the course of the telephone interview, Applicants explained that, as more fully set forth below, Unland et al. do not disclose, or even suggest, adding together a base ignition angle and two ignition angle adjustments, as required by claim 15, and that, since Unland et al. do not disclose, or even suggest, all of the features recited in claim 15, Unland et al. do not anticipate claim 15. However, no agreement was reached regarding this anticipation rejection of claim 15.

The general result or outcome of the telephone interview is that an agreement was reached in part.

III. Rejection of Claims 15, 27, and 28 Under 35 U.S.C. § 102(b)

Claims 15, 27, and 28 were rejected under 35 U.S.C. § 102(b) as anticipated by Unland et al. It is respectfully submitted that Unland et al. do not anticipate the present claims for the following reasons.

Claim 15 recites a method for determining an ignition angle for an internal combustion engine, which method includes adding a base ignition angle, a first ignition angle adjustment determined as part of a knock control, and a second ignition angle adjustment determined as part of a knock limit control to form a maximum value for adjustment of an ignition angle. Unland et al. do not disclose, or even suggest, these features.

Referencing figure 1 of Unland et al., the Examiner asserts that step 10 discloses determining a base ignition angle, step 12 discloses determining a first ignition angle adjustment in a retarding direction, and steps 16, 17, 11, and (again) 12 disclose determining a second ignition angle adjustment. The Examiner further asserts that, at column 2, line 15 to column 3, line 6, Unland et al. disclose adding these three values.

The Examiner's characterization of the cited sections is incorrect. In Unland et al., at step 10, a basic ignition point 'ZWGRU' is determined; at step 11, a correction value ' $\Delta ZW-KR$ ' is determined; and at step 12, the two determined variables are added to form 'ZW(KR).' At no point is 'ZW(KR)' summed with another variable. Instead, subsequent to step 12, it is ensured that an ignition point to be issued falls within a permissible range, *i.e.*, between the value of ' Zw_{ret} ' and 'ZW-MD.' (Column 2, lines 31 to 55). Subsequently, a new correction value ' $\Delta ZW-KR$ ' is determined, *e.g.*, at steps 16, 17, and 11, which is then added again, at step 12, to determined basic ignition point 'ZWGRU.' However, at step 12 of each cycle, only two variables are summed. Nowhere do Unland et al. disclose, or even suggest, summing three different determined variables. Thus, Unland et al. do not disclose, or even suggest, all of the features recited in claim 15.

During the course of the telephone interview of January 11, 2007, the Examiner expressed his understanding that step 12 of Unland et al. is performed in a cumulative manner, so that, during a second loop through the method illustrated in figure 1 of Unland et al., a second correction factor ' $\Delta ZW-KR$ ' (' $\Delta ZW-KR_2$ ') determined at step 11 is added at step 12 to a knock control ignition point 'ZW(KR)' determined during a previous execution of step 12 in

a previous loop through the method by adding a first correction factor ' $\Delta ZW-KR$ ' (' $\Delta ZW-KR_1$ ') to a basic ignition point 'ZWGRU' determined at step 10. The Examiner therefore asserts that Unland et al. disclose summing two correction factors and a basic ignition point during the second loop through the method of figure 1 at step 12.

In this regard, the Examiner incorrectly treats box 12 of figure 1 as a memory storing a value 'ZW(KR)' to which a correction value is added. In fact, figure 1 is a flowchart illustrating steps performed in a process. (Column 2, lines 7 to 9). The expression " $ZW(KR) = ZWGRU + \Delta ZW-KR$ " describes that which is performed at step 12; it does not represent a memory storing a value 'ZW(KR).' Thus, as indicated by the legend of box 12, the step performed is to set a variable 'ZW(KR)' to 'ZWGRU' + ' $\Delta ZW-KR$.' This same step, without variation, is performed each time the loop illustrated in figure 1 reaches step 12. Thus, each time step 12 is performed, the same two variables, *i.e.*, the basic ignition point 'ZWGRU' determined at step 10 and a correction value ' $\Delta ZW-KR$ ' newly determined at step 11 with each pass through the loop, are summed.

Careful analysis of figure 1 and the corresponding text in the specification reveals this to be the case. It is indicated that, with respect to the particular method steps illustrated in figure 1, a start of the flow illustrated in figure 1 assumes a correction value ' $\Delta ZW-KR$ ' to have been determined in a previous loop through the steps. That is, the steps executed in the first pass through figure 1 and the steps executed during subsequent passes through figure 1 are the same in that it is assumed that a correction value ' $\Delta ZW-KR$ ' had been previously determined during a knock control 'KR' of step 11 performed during a previous loop. (See column 2, lines 23 to 28). (This is not to say that the steps performed at initial engine start up are necessarily the same as those performed later on, but rather that Unland et al. do not describe such initial steps with respect to figure 1.) Nevertheless, Unland et al. indicate that the correction value ' $\Delta ZW-KR$ is added to only a single other variable, *i.e.*, 'ZWGRU' determined at a step 10; it is not added to two variables 'ZWGRU' and ' $\Delta ZW-KR_2$ ' summed in a previous step 12.

Furthermore, other than explaining the knock control 11 performed after a first described loop through the steps of figure 1 to be "as was already described above" (column 2, lines 56 to 64), Unland et al. fail to describe how the output of step 11, *i.e.*, correction value ' $\Delta ZW-KR$,' might be used to control knock. This further indicates that the correction value ' $\Delta ZW-KR$ ' output in a subsequent loop through the method is indeed used again exactly as it had been used in the step 12 of the initially described loop through the method, *i.e.*, it is added to basic ignition point 'ZWGRU' to form a new ignition point 'ZW(KR).'

Furthermore, it is clear that Unland et al. require the correction factor 'ΔZW-KR' to be added to only the basic ignition point 'ZWGRU' during every pass through the loop of figure 1 for the following reason. In the 'N' branch extending from the step 17 labeled "ZW-MD more retarded than ZW(KR)?," step 19 is performed for ignition advance. As explained at column 3, lines 34 to 40, this refers to a stepwise advance of the ignition point from a value 'ZW(KR)' determined at time t_1 when initially changing the ignition point from the basic ignition point 'ZWGRU' back towards the basic ignition point 'ZWGRU.' To do so, it is indicated that the value 'ΔZW-KR' is reduced step-by-step to slowly reverse the degree of change from the basic ignition point 'ZWGRU' to be applied. However, if the method of figure 1 would be performed as suggested by the Examiner, *i.e.*, to perform step 12 in a cumulative manner, then the reduced value of 'ΔZW-KR' would be added to the value 'ZW(KR)' representing an already modified basic ignition point, which would not slowly reverse the degree of change; instead, such cumulative performance of step 12 would continuously advance the degree of change from the basic ignition point 'ZWGRU,' albeit to a lesser extent than the initial advancement. In other words, if step 12 would be performed in a cumulative manner as proposed by the Examiner, then, at time t_2 of figure 2, the level of the line representing the actual ignition point would not reverse direction to move upwards step-by-step, but would instead continue to drop in the same direction as shown at time t_1 (but at a slower pace). Thus, contrary to the Examiner's assertion, step 12 is necessarily performed in a non-cumulative manner.

In any case, to reject a claim under 35 U.S.C. § 102(b), the Office must demonstrate that each and every claim feature is identically described or contained in a single prior art reference. (*See Scripps Clinic & Research Foundation v. Genentech, Inc.*, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991)). The Examiner has not satisfied this burden because, even assuming for argument's sake that step 12 can be performed in a cumulative manner (which it cannot), nowhere in Unland et al. is there any indication whatsoever that step 12 is indeed performed in this manner. Thus, regardless of any possibility that step 12 may be so performed, such a conclusion is pure conjecture, is not disclosed in Unland et al., and cannot be considered as a basis for an anticipation rejection based on Unland et al. To the extent that the Examiner may be relying on the doctrine of inherent disclosure for the rejection, the Examiner must provide a "basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristics necessarily flow from the teachings of the applied art," (see M.P.E.P. § 2112; emphasis in original; see also Ex parte Levy, 17

U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)), which requirement the Examiner has clearly failed to meet.

Thus, Unland et al. do not disclose, or even suggest, all of the features recited in claim 15. Accordingly, Unland et al. do not anticipate claim 15.

With respect to claims 27 and 28, the Examiner has not at all addressed the features recited in these claims and has therefore not satisfied the Examiner's burden of presenting a *prima facie* case of anticipation. Indeed, it is respectfully submitted that Unland et al. do not disclose, or even suggest all of the features recited in either of claims 27 and 28. For example, Unland et al. do not disclose, or even suggest, interrupting a knock limit control. During the course of the telephone interview of January 11, 2007, the Examiner agreed that claims 27 and 28 are not anticipated by Unland et al. and should not have been rejected under 35 U.S.C. § 102(b) as anticipated by Unland et al. The Examiner indicated that he intended to reject claims 27 and 28 under 35 U.S.C. § 103(a) as unpatentable over the combination of Unland et al. and the disclosure which the Office Action refers to as Applicants' "Admitted Prior Art" ("APA").

Withdrawal of the anticipation rejection of claims 15, 27, and 28 is therefore respectfully requested.

IV. Rejection of Claims 15 to 21, 26 and 27 Under 35 U.S.C. § 103(a)

Claims 15 to 21, 26 and 27 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Unland et al. and APA. Without addressing or agreeing with this characterization of any of Applicants' disclosure as constituting an admission of prior art, it is respectfully submitted, for the purposes of this response, that the combination of Unland et al. and APA does not render unpatentable the present claims for the following reasons.

As an initial matter, the Office Action indicates that claim 26 is rejected, but also indicates that claim 26 includes allowable subject matter. During the course of the telephone interview of January 11, 2007, the Examiner agreed that claim 26 includes allowable subject matter, and that the indication in the Final Office Action of November 1, 2006 that claim 26 is rejected under 35 U.S.C. § 103(a) is a typographical error.

During the course of the telephone interview of January 11, 2007, the Examiner indicated that he intended to additionally include claim 28 in this rejection.

Establishment of *prima facie* obviousness requires satisfaction of three separate criteria. First, there must be some suggestion or motivation to modify or combine reference teachings. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the proposed combination must be found in the prior art and not based on the application disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). The reasonable expectation of success must be found in the prior art, and must not be based on applicant's disclosure. *In re Vaeck, supra*. Third, the prior art reference(s) must teach or suggest all of the claim limitations. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

As set forth above in support of the patentability of claims 15 and 27 under 35 U.S.C. § 102(b), Unland et al. do not disclose or suggest all of the features recited in either of claims 15 and 27. The Examiner does not indicate where APA discloses, or how a combination of Unland et al. and APA might suggest, the features of claims 15 and 27 not disclosed by Unland et al. In fact, with respect to claim 27, the Examiner does not at all address the features recited in the claim. Indeed, it is respectfully submitted APA does not correct the deficiencies noted above with respect to Unland et al. Since APA does not correct the deficiencies noted above with respect to Unland et al., the combination of Unland et al. and APA does not render unpatentable either of claims 15 and 27.

As for claims 16 to 21, which depend from claim 15, and therefore include all of the features recited in claim 15, it is respectfully submitted that the combination of Unland et al. and APA does not render unpatentable these dependent claims for the same reasons set forth above in support of the patentability of claim 15. *In re Fine, supra* (any dependent claim that depends from a non-obvious independent claim is non-obvious).

As for claim 28, which depends from claim 27, and therefore includes all of the features recited in claim 27, it is respectfully submitted that the combination of Unland et al. and APA does not render unpatentable this dependent claim for the same reasons set forth above in support of the patentability of claim 27. *Id.*

Withdrawal of this obviousness rejection is therefore respectfully requested.

V. Conclusion

In light of the foregoing, it is respectfully submitted that all of the presently pending claims are in condition for allowance. Prompt reconsideration and allowance of the present application are therefore earnestly solicited.

Respectfully submitted,

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